



Standard Specification for Forged or Rolled 8 and 9% Nickel Alloy Steel Flanges, Fittings, Valves, and Parts for Low-Temperature Service¹

This standard is issued under the fixed designation A 522/A 522M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification² covers 8 and 9 % nickel-alloy steel forged or rolled flanges, fittings, valves, and parts intended for use in welded pressure vessels for low-temperature service. The specification is applicable to forgings with maximum section thickness of 3 in. [75 mm] in the double normalized and tempered condition and 5 in. [125 mm] in the quenched and tempered condition. Forgings under this specification are intended for service at operating temperatures not lower than -320°F [-196°C] for Type I or -275°F [-170°C] for Type II or higher than 250°F [121°C].

1.2 Material under this specification is available in two types having different chemical compositions as follows:

Type	Nominal Nickel Content, %
I	9
II	8

1.3 Supplementary requirements S1 and S2 are optional and shall apply when specified by the purchaser.

1.4 This specification is expressed in both inch-pound units and SI units. However, unless the order specifies the applicable “M” specification designation (SI units), the material shall be furnished to inch-pound units.

1.5 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products³

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Valves and Fittings.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SA-522 in Section II of that Code.

³ *Annual Book of ASTM Standards*, Vol 01.03.

A 788 Specification for Steel Forgings, General Requirements⁴

3. Ordering Information

3.1 It is the purchaser’s responsibility to specify in the purchase order all ordering information necessary to purchase the needed material. Examples of such information include but are not limited to the following:

3.1.1 Quantity,

3.1.2 Size and pressure class or dimensions (Tolerances and surface finishes should be included),

3.1.3 Specification number and type (The year date should be included),

3.1.4 Supplementary requirements, and

3.1.5 Additional requirements, (See 4.4, 13.6, 16.1, 17.1, 17.2, and 18.3).

4. Materials and Manufacture

4.1 The steel shall be produced in accordance with the melting process section of Specification A 788.

4.2 Material for forgings shall consist of ingots, or either forged or rolled blooms, billets, or bars.

4.3 The finished product shall be a forging as defined in the Terminology Section of Specification A 788.

4.4 When specified in the order, the manufacturer shall submit for purchaser’s approval a sketch showing the shape of the rough forging before machining.

5. Chemical Composition

5.1 The steel shall conform to the requirements for chemical composition as prescribed in Table 1. Test Methods, Practices, and Terminology A 751 shall apply.

6. Tensile Requirements

6.1 The forgings shall conform to the tensile property requirements prescribed in Table 2.

6.2 The forgings shall be tested in accordance with the latest issue of Test Methods and Definitions A 370.

7. Impact Requirements

7.1 Impact tests shall be conducted at -320°F [-195°C] for Type I and at -275°F [-170°C] for Type II, except when a

⁴ *Annual Book of ASTM Standards*, Vol 01.05.